Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Painting Towers

Today you will study a pattern built from cubes and write a variable expression for the pattern. To help you work together, each of you has a team job, assigned alphabetically by your first name, (or your last name if two of you have the same first name). Before you begin, review the study-team job outlined below. Each team member reads aloud the description of their role.

|  |
| --- |
| **Team Jobs and Responsibilities** |

|  |  |
| --- | --- |
| Job | Name |
| **Team Starter**  Helps team get started by having someone read the task aloud.  Gets the team to start talking about the problem.  Makes sure everyone understands the task.   * “\_(Name)\_, will you read the first paragraph? * *“Who knows how to start?”* * *“Does everyone get what we are to do?”* |  |
| **Team Recorder**  Makes sure everyone understands and does all the work.  Collects and turns in finished work.   * *“Did everyone get that written down?”* * *“Does everyone understand what we just did?”* * *“Are we ready to move on?”* * *“Has everyone handed me their paper?”* |  |
| **Resource Manager**  Gets materials and supplies for the team.  Organizes cleanup.   * Has everyone returned their calculator? * “We need to clean up. Can you…while I…?” |  |
| **Team Captain**  Encourages Participation  Reminds team of study-team rules.  Calls the teacher over when the whole team has a question.  Goes to teacher huddles.   * *“Is everyone listening to \_(name)\_ ?”* * *“What do you think, \_(name)\_?”* * *“Remember, no talking outside our team.”* * *“Does everyone agree that we need to ask for help?”* |  |

**Team Starter**, have your team read and discuss the study-team rules. Then everyone complete the table.

|  |  |
| --- | --- |
| Study Team Rule | What Does This Rule Mean?  Why Is It Important? |
| 1. Everyone participates. Everyone does  their own work. No copying. |  |
| 2. Everyone stays on the same problem and  helps until everyone completes each  problem. |  |
| 3. Only work with your team members. No  talking to other teams during study-team  time. |  |
| 4. You must use study-team voices. |  |
| 5. You should only ask the teacher for help  when all team members have the same  question. |  |

Find one interesting thing that all members of your study team have in common. Write it here.

**Now turn the page and begin the math. Team captain, raise your hand when your team has completed “Painting Towers” so that the teacher can check your work before you go on to “Painting Towers 2”.**

Activity: Painting Towers

Reminders: **Team Starter**, get your team started. **Resource Manager**, pick up cube blocks for your team.

Suppose you are painting a tower built from cube blocks, based on the pattern below. Complete the table. Let represent the number of blocks in the tower and write a variable expression for the number of faces to paint. (Paint only the sides and the top of the tower.)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Number  of Blocks | Draw  Figure | Written  Description | Process  Column | Faces  to Paint |
| 1 |  | 4 faces around the sides 1 cube tall plus 1 face on the top. |  | 5 |
| 2 |  | 4 faces around the sides of 2 cubes plus 1 face on the top. |  | 9 |
| 3 |  |  |  |  |
| 4 |  |  |  |  |
| *n* |  | Let represent the number of blocks and **write a variable expression** for the number of faces to paint |  | Evaluate when |

How many faces will you need to paint on a tower that is 12 blocks tall? \_\_\_\_\_\_\_\_\_\_\_\_

Painting Towers 2

Now Suppose you make a tower from rows of 2 cubes. Complete the table. Let represent the number of rows of blocks and write a variable expression for the number of faces to paint.

(Paint only the top and sides of the tower.)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Number  of Rows | Draw  Figure | Written  Description | Process  Column | Faces  to Paint |
| 1 |  | 6 faces around the sides of 1 row of blocks plus 2 faces on the top. |  | 8 |
| 2 |  | 6 faces around the sides of 2 rows of blocks plus 2 faces on the top. |  |  |
| 3 |  |  |  |  |
| 4 |  |  |  |  |
| *n* |  | Let represent the number of rows and **write a variable expression** for the number of faces to paint. |  | Evaluate when |

How many faces will you need to paint on a tower that is 15 rows tall? \_\_\_\_\_\_\_\_